

Schedule A  
to the Response the Office Action of June 26, 2007

Please amend the Claims of the specification to read as follows:

Claims 1-13 (Cancelled)

14. (Withdrawn) A tubular baseball bat with a longitudinal axis comprising a cylindrical handle portion for gripping, a cylindrical tubular barrel portion of given length for striking, the barrel portion having a barrel wall with a sweet spot area within its length, and a tapered bridging portion connecting the handle portion and the barrel portion, wherein the barrel portion has:

- a) a distal end remote from the handle;
- b) a proximal end where the tapered portion connects to the handle portion;
- c) a mid-section within the barrel portion, the mid-section being of shorter length than the length of the barrel portion and including the sweet spot area;
- d) two lateral regions extending on either sides of the mid-section towards the distal and proximal ends respectively, and
- e) a radial stiffness for the barrel wall at each location along the length of the barrel portion,

the radial stiffness of the barrel wall being greater in the mid-section of the barrel portion than in the two lateral regions of the barrel portion

to provide a flattened batting performance over the mid-section that is flattened compared to what otherwise would exist without the presence of the greater radial stiffness in the mid-section and which is characteristic of an enlarged sweet spot.

15. (Withdrawn) A bat as in Claim 14 wherein the barrel portion comprises a barrel wall of polymer composite material and the polymer composite material provides a radial stiffness in the barrel wall within the mid-section of the barrel portion which is greater than the radial stiffness of the barrel wall within the lateral regions.

16. (Withdrawn) A bat as in Claim 15 wherein the polymer composite material contains reinforcing fibers and the reinforcing fibers are angled within the barrel wall of the mid-section to provide the barrel wall with a radial stiffness in the mid-section that is greater than the radial stiffness of the barrel wall within the two lateral regions of the barrel portion.

17. (Withdrawn) A bat as in Claim 15 wherein the polymer composite material contains reinforcing fibers at various angles with respect to the longitudinal axis, the reinforcing fibers present within the barrel wall of the mid-section being at a higher average angle from the longitudinal axis than the average angle of the fibers within the barrel wall of the two lateral regions of the barrel portion.

18. (Withdrawn) A bat as in Claim 15 wherein the polymer composite material contains reinforcing fibers of types having differing stiffnesses, and the reinforcing fibers within the barrel wall of the mid-section contain a higher percentage of fibers of higher stiffness than in the lateral regions to provide the barrel wall with a radial stiffness in the mid-section that is greater than the radial stiffness of the barrel wall within the two lateral regions of the barrel portion.

19. (Withdrawn) A bat as in Claim 15 wherein the barrel wall has a thickness and wherein the polymer composite material of the barrel wall is of a greater thickness within the barrel wall of the mid-section than in the lateral regions by at least  $8\frac{1}{3}\%$  to provide the barrel wall with a radial stiffness in the mid-section that is greater than the radial stiffness of the barrel wall within the two lateral regions of the barrel portion.

20. (Withdrawn) A bat as in Claim 14 wherein the barrel wall has a thickness and the thickness of the barrel wall in the mid-section is greater than the thickness of the barrel wall in the lateral regions by at least  $8\frac{1}{3}\%$  whereby the radial stiffness of the barrel wall in the mid-section of the barrel portion is greater than the radial stiffness of the barrel wall in the lateral regions.

21. (Withdrawn) A bat as in Claim 20 wherein the thickness of the mid-section of the barrel portion is greater than the thickness of the lateral regions at their thinnest parts by at least 5%.

22. (Withdrawn) A bat as in Claim 14 wherein the barrel portion has inner and outer surfaces, the barrel portion comprising a stiffener positioned along the mid-section of the barrel portion

adjacent the inner or outer surface of the barrel portion, whereby the radial stiffness of the barrel wall with the stiffener present along the mid-section of the barrel portion is greater than the radial stiffness of the barrel wall in the lateral regions.

23. (Withdrawn) A bat as in Claim 22 wherein the stiffener has a stiffener wall having a thickness of between .005 inches 0.040 inches.
24. (Withdrawn) A bat as in Claim 22 wherein the stiffener has a length of 2 to 6 inches.
25. (Withdrawn) A bat as in Claim 22 wherein the stiffener is unbonded along its length to the barrel portion.
26. (Withdrawn) A bat as in Claim 22 wherein the stiffener is bonded at least partially along its length to the barrel portion.
27. (Withdrawn) A bat as in Claim 22 wherein the stiffener is bonded fully along its length to the barrel portion.
28. (Withdrawn) A bat as in any one of Claims 22, 23, 24, 25, 26 or 27 wherein the stiffener is located on the inner surface of the barrel portion.
29. (Withdrawn) A bat as in any one of Claims 22, 23, 24, 25, 26 or 27 wherein the stiffener is located on the external surface of the barrel portion.
30. (Withdrawn) A bat as in any one of Claims 22, 23, 24, 25, 26 or 27 wherein the stiffener is composed of polymer composite material which comprises a resin matrix encapsulating reinforcement fibers wherein the resin is selected from the group of resin consisting of epoxy, vinyl ester, polyester, urethane, nylon, and mixtures thereof and wherein the reinforcement fibers are selected from the group consisting of fiberglass, graphite, carbon, aramid, boron, nylon fibers and mixtures thereof.
31. (Canceled)

32. (Canceled)

33. (Withdrawn) A bat as in any one of Claims 14, 15, 16, 17, 18, 19, or 20 wherein the mid-section has a length that is less than 33.3% of the length of the barrel portion.

34. (Withdrawn) A bat as in 33 wherein the mid-section has a length that is less than 25% of the length of the barrel portion.

35. (Withdrawn) A bat as in 33 wherein the mid-section has a length that is less than 16 2/3% of the length of the barrel portion.

36. (Withdrawn) A bat as in any one of Claims, 15, 16, 17, 18, 19 or 20 wherein the bat consists of polymer composite material which comprises a resin matrix encapsulating reinforcement fibers wherein the resin is selected from the group of resin consisting of epoxy, vinyl ester, polyester, urethane, nylon, and mixtures thereof and wherein the reinforcement fibers are selected from the group consisting fiberglass, graphite, carbon, aramid, boron, nylon fibers and mixtures thereof.

37. (Currently amended) A tubular bat with a longitudinal axis comprising a cylindrical handle portion for gripping, a cylindrical tubular barrel portion of given length for striking, the barrel portion having a barrel wall with a barrel wall thickness and distinct locations including a sweet spot area within its length, and a tapered portion connecting the handle portion and the barrel portion, wherein the barrel portion has:

- a) a distal end remote from the handle;
- b) a proximal end where the tapered portion connects to the handle portion;
- c) a mid-section within the barrel portion, the mid-section being of shorter length than the length of the barrel portion and including the sweet spot area; and
- d) two lateral regions commencing immediately adjacent to and extending respectively on each either side of the mid-section towards the distal and proximal ends respectively,

the radial stiffness of the barrel wall being greater in the mid-section of the barrel portion than in the two lateral regions of the barrel portion

wherein the barrel wall of the barrel portion consists essentially of polymer composite material containing reinforcing fibers at various angles with respect to the longitudinal axis, the reinforcing fibers present within the barrel wall of the mid-section being at a higher average angle with respect to the longitudinal axis than the average angle of the fibers within the barrel wall of the two lateral regions of the barrel portion

to provide the barrel wall with said radial stiffness in the mid-section that is greater than the radial stiffness of the barrel wall within the two lateral regions of the barrel portion and thereby with a **broadened an enlarged** sweet spot.

38. (Currently amended) A tubular bat with a longitudinal axis comprising a cylindrical handle portion for gripping, a cylindrical tubular barrel portion of given length for striking, the barrel portion having a barrel wall with a barrel wall thickness and distinct locations including a sweet spot area within its length, and a tapered portion connecting the handle portion and the barrel portion, wherein the barrel portion has:

- a) a distal end remote from the handle;
- b) a proximal end where the tapered portion connects to the handle portion;
- c) a mid-section within the barrel portion, the mid-section being of shorter length than the length of the barrel portion and including the sweet spot area; and
- d) two lateral regions **commencing immediately adjacent to and** extending **respectively** on **each either** side of the mid-section towards the distal and proximal ends respectively,

the radial stiffness of the barrel wall being greater in the mid-section of the barrel portion than in the two lateral regions of the barrel portion

wherein the barrel wall of the barrel portion consists essentially of polymer composite material which contains reinforcing fibers and the barrel wall in the mid-section contains a higher percentage of fibers than in the lateral regions

to provide the barrel wall with said radial stiffness in the mid-section that is greater than the radial stiffness of the barrel wall within the two lateral regions of the barrel and thereby with a **broadened an enlarged** sweet spot.

39. (Currently amended) A tubular bat comprising a cylindrical handle portion for gripping, a cylindrical tubular barrel portion of given length for striking, the barrel portion having a barrel wall a barrel wall thickness and distinct locations including a sweet spot area within its length, and a tapered portion connecting the handle portion and the barrel portion, wherein the barrel portion has:

- a) a distal end remote from the handle;
- b) a proximal end where the tapered portion connects to the handle portion;
- c) a mid-section within the barrel portion, the mid-section being of shorter length than the length of the barrel portion and including the sweet spot area; and
- d) two lateral regions **commencing immediately adjacent to and** extending **respectively on each** ~~either~~ side of the mid-section towards the distal and proximal ends respectively,

the radial stiffness of the barrel wall being greater in the mid-section of the barrel portion than in the two lateral regions of the barrel portion

wherein the barrel wall of the barrel portion consists essentially of polymer composite material wherein the polymer composite material contains reinforcing fibers of types having differing stiffnesses, and the reinforcing fibers within the barrel wall of the mid-section contain a higher percentage of fibers of higher stiffness than in the lateral regions

to provide the barrel wall with said radial stiffness in the mid-section that is greater than the radial stiffness of the barrel wall within the two lateral regions of the barrel and thereby with a **broadened an enlarged** sweet spot.

40. (Canceled)

41. (Partially Withdrawn - previously presented) A bat as in any one of Claims 37, 38 or 39 wherein the mid-section has a length that is less than 50% of the length of the barrel portion.

42. (Partially Withdrawn - currently amended) A bat as in Claim 41 ~~any one of Claims 37, 38 or 39~~ wherein the mid-section has a length that is ~~less than~~ between 33.3% to 12 1/2 % of the length of the barrel portion.

43. (Partially Withdrawn - previously presented) A bat as in Claim 42 wherein the mid-section has a length that is ~~less than~~ between 25% to 12 1/2 % of the length of the barrel portion.

44. (Partially Withdrawn - previously presented) A bat as in Claim 42 wherein the mid-section has a length that is ~~less than~~ between 16 2/3% to 12 1/2 % of the length of the barrel portion.

45. (Currently amended) A bat as in any one of Claims 37, 38, 39, 40, 41, 42, 43 or 44 ~~Claim 42 wherein the mid-section has a length that is less than 12 1/2% of the length of the barrel portion; wherein the radial stiffness of the barrel wall in the mid-section provides the bat with a relatively flattened batting performance level along such mid-section compared to the batting performance level along the immediately adjacent portions of the lateral regions on the respective sides of the mid-section.~~

46 - 52 (Canceled).

53. (Currently amended) A tubular bat with a longitudinal axis comprising a cylindrical handle portion for gripping, a cylindrical tubular barrel portion of given length for striking, the barrel portion having a barrel wall with a barrel wall thickness and distinct locations including a sweet spot area within its length, and a tapered bridging portion connecting the handle portion and the barrel portion, wherein the barrel portion has:

- a) a distal end remote from the handle;
- b) a proximal end where the tapered portion connects to the handle portion;
- c) a mid-section within the barrel portion, the mid-section being of shorter length than the length of the barrel portion and including the sweetspot area;

- d) two lateral regions commencing immediately adjacent to and extending respectively on each either side of the mid-section towards the distal and proximal ends respectively, and
- e) a radial stiffness for the barrel wall at each location along the length of the barrel portion

wherein the barrel wall thickness in the barrel mid-section that contains the sweet spot area is greater than the thickness of the barrel wall in the lateral regions by at least 5% over the thinnest portion of the barrel wall in the lateral regions, and

wherein the barrel wall of the barrel portion consists essentially of polymer composite material, and

wherein the area of greater thickness in the barrel mid-section is formed of the same general material as the underlying barrel wall portion with which it is associated.

to provide the barrel wall with a radial stiffness in the mid-section that is greater than the radial stiffness of the barrel wall within the two lateral regions of the barrel portion and thereby with a broadened an enlarged sweet spot.

54. (Currently amended) A bat as in Claim 53 wherein ~~[[I]] the thickness of the total barrel wall is at least 5% greater in the barrel mid-section than in the two lateral regions.~~ wherein radial stiffness in the mid-section provides the bat with a relatively flattened batting performance level along such mid-section compared to the batting performance level along the immediately adjacent portions of the lateral regions on the respective sides of the mid-section.

55. (Currently amended) A bat as in Claim 54 wherein ~~[[I]] the thickness of the total barrel wall is 0.005 to 0.040 inches greater in the barrel mid-section than in the two lateral regions.~~

56. (Currently amended) A bat as in Claim 55 wherein the radial stiffness of the barrel wall in the mid-section provides the bat with a batting performance level that is reduced to substantially the batting performance level of the portions of the lateral regions immediately adjacent to each side of the mid-section.



~~[[ -]] the area of greater thickness in the barrel mid-section is integrally formed with the barrel wall portion whereby the thickened portion is formed of the same material as the underlying barrel wall portion without there being present a boundary therebetween.~~

57 - 59 (Canceled)

60. (Previously presented) A bat as in any one of Claims 53, 54, 55 or 56 wherein the increased thickness of the barrel wall in the barrel mid-section is the only part of the barrel portion that is of increased thickness over the thickness of the barrel wall in the lateral regions.

61. (Previously presented) A bat as in any one of Claims 53, 54, 55 or 56 wherein the barrel mid-section of increased thickness is centered around the middle of the barrel.

62. (Currently amended) A bat as in any one of Claims 37, 38, 39, 53, 54, 55 or 56 wherein the lateral regions start from 1" to up to but not including ~~[[3]]~~ 2" from the center of the mid-section and extend towards the proximal and distal barrel ends.

63. (Previously presented) A bat as in any one of Claims 53, 54, 55 or 56 wherein the mid-section has a length that is less than 50% of the length of the barrel portion.

64. (Previously presented) A bat as in Claim 63 wherein the mid-section has a length that is ~~less than~~ between 33.3% and 12 1/2% of the length of the barrel portion.

65. (Previously presented) A bat as in Claim 63 wherein the mid-section has a length that is ~~less than~~ between 25% and 12 1/2% of the length of the barrel portion.

66. (Previously presented) A bat as in Claim 63 wherein the mid-section has a length that is ~~less than~~ between 16 2/3% and 12 1/2% of the length of the barrel portion.

67. (Previously presented) A bat as in any one of Claims 37, 38, 39, 53, 54, 55 or 56 wherein the bat is a single wall bat.

68. (Previously presented) A bat as in any one of Claims 37, 38, 39, 53, 54, 55 or 56 wherein the bat is a multi-wall bat, which includes a double wall bat.

69. (Previously presented) A bat as in any one of Claims 53, 54, 55 or 56 wherein the barrel wall thickness on either side of the barrel mid-section that contains the sweet spot area is graduated towards a decreasing thickness within the lateral regions.

70 - 71 (Canceled)

72. (Currently amended) A bat as in Claim 60 wherein ~~the mid-section has a length that is less than 12 1/2% of the length of the barrel portion. wherein the barrel wall thickness in the barrel mid-section that contains the sweet spot area is greater than the thickness of the barrel wall in the lateral regions by at least 8 1/3 % over the thinnest portion of the barrel wall in the lateral regions.~~

73. (New) A bat as in Claim 55 wherein the thickness of the total barrel wall is greater in the barrel mid-section than in the two lateral regions by an amount selected from the group of ranges consisting of .010 inches to .040 inches in thickness; .015 inches to .040 inches in thickness, and 0.015 inches to 0.030 inches.

74. (New) A bat as in any one of Claims 53, 54, 55, 56 or 73 wherein the bat is a double-wall bat having an exterior frame with a tubular barrel and an inner tubular insert within the barrel, the insert having a thickened portion extending internally within the insert along the mid-section of the barrel to provide the barrel wall with its barrel wall portion of greater thickness.

75. (New) A bat as in Claim 45 wherein the radial stiffness of the barrel wall in the mid-section provides the bat with a batting performance level that is reduced to substantially the batting performance level of the portions of the lateral regions immediately adjacent to each side of the mid-section.